DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
690 Walnut Ave.St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-002910
Date Inspected: 12-Jun-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1530
Location: Shanghai, China

CWI Name:	Wu Ming Cai and Zhao Chen Sun			**CWI Present:**	☑ Yes	☐ No	
Inspected CWI report:	☐ Yes	☑ No	☐ N/A	**Rod Oven in Use:**	☑ Yes	☐ No	☐ N/A
Electrode to specification:	☑ Yes	☐ No	☐ N/A	**Weld Procedures Followed:**	☑ Yes	☐ No	☐ N/A
Qualified Welders:	☑ Yes	☐ No	☐ N/A	**Verified Joint Fit-up:**	☑ Yes	☐ No	☐ N/A
Approved Drawings:	☑ Yes	☐ No	☐ N/A	**Approved WPS:**	☑ Yes	☐ No	☐ N/A
				Delayed / Cancelled:	☐ Yes	☑ No	☐ N/A

Bridge No: 34-0006
Component: OBG and SAS Tower Fabrication

Summary of Items Observed:

On this date, Caltrans Office of Structural Material (OSM) Quality Assurance (QA) Inspector Joselito Lizardo was present as requested to perform observations on the fabrication of Orthotropic Box Girder (OBG) and SAS Tower at Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China.

The QA Inspector has randomly observed the following activities on these Bays mentioned below;

Bay 2: 77 and 114M Tower Mock-ups, Plate Cutting, Rolling
This QA Inspector observed machining/beveling of various plates 60mm thick X 400mm wide X 1010mm long marked P122, P405, P328 and P242 that appear to be stiffener plates were seen in progress; drilling of 18-24mm diameter bolt holes on 24mm thick X 340mm wide X 1105mm long for various connection plates on going; cutting of 30mm thick plate material A709M 345F2-X-Z marked FB14A, FB14B, FB5A and FB5B as part of floor beam sub-assembly on going and rolling of 60mm thick X 405mm wide marked P222B seen complete which appears to be longitudinal skin plate stiffener. Tower mock up for elevation 114Meters has 4 ZPMC personnel putting back bolts and nuts on connector plate to tower splice.

Bay 3: OBG side/bottom/edge panel:
This QA Inspector observed 6-WT rib stiffener side panel SP180-001-007~018 being clamped at gantry #1. In this side panel, the tack welds noted ground/cleaned, fit-up of WT rib stiffener to plate acceptable, and paint coating removed on weld surfaces. At gantry #2, preheating on 2-open rib stiffener edge panels EP054-001-005/006 and EP040-001-006/007 noted in preparation for fillet welding.

FCAW (3G) CJP welding on flange splice butt joint of W21x57 for side panel SP172-001-050 and SP175-001-055 this QA Inspector observed. Grinding of cut edges and taking off paint coating on WT (W21x57) rib stiffener for various side panels continues.

Tack welding/fit up of open 3-open rib stiffener to deck panel DP021-001-001~006, DP048-001-001~006, DP034-001-003~006 and DP045-001-003~006, using electrode THJ506Fe-1 was in progress. Two ZPMC qualified welders ID #048800 and ID #066418 were noted doing this task and ZPMC CWI Wu Ming Cai was monitoring these welders so with other ZPMC QC personnel.

Bay 4: Tower Diaphragm
The QA Inspector randomly observed three ZPMC welders ID number 054460, 053605 and 053742 utilizing the FCAW Process in the 3G (Vertical Groove) Position with ZPMC WPS WPS-B-T-2233-B-U3-F, to weld groove (bent heavy plate) splice butt joint on Tower Diaphragm Flange Sub-Assembly SSD1-SA335-6B, ESD1-SA234-5B and ESD1-SA317-5A respectively. The QA Inspector randomly observed ZPMC CWI Zhao Chen Sun monitoring weld parameters. The weld parameters observed were 213Amps, 25.6Volts and 116 mm/min travel speed (for 054460), 216Amps, 25.9Volts and 117 mm/min travel speed (for 053605) and 212Amps, 25. 8Volts and 116mm/min travel speed (for 053742) which appeared to comply with contract requirements. Tack weld/fit-up utilizing FCAW 3G on preassembly of tower diaphragm flanges ESD1-SA268 and SSD1-SA276 this QA observed and bending of various sizes and shapes of heavy metal for diaphragm flange. Plate being bent was P1255(W)-1 5/5(E) using oxy-acetylene gas of less than 650 degree C thermal heat input with the aid of hydraulic ram and welded jig following procedure HSR1(T)-2057.

The QA Inspector randomly observed ZPMC welder ID Number 046830, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate butt splices of Tower Diaphragm WSD1-SA287-3A/4A. The QA Inspector randomly observed ZPMC Zhao Chen Sun, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 634 amps, 30.8 volts with a travel speed of 493 mm per minute. Weld parameters appeared to comply with contract requirements.

This QA observed completely welded plate splice for various tower diaphragms were stacked on top of each other but having support at each end of the plate too far which make the plates sagged at the middle. Caltrans QA informed one of the ABF QA Inspector concerning this and he told this QA that he would ask ZPMC to put more lumber at the middle of the plates. See photo below.

Bay 7: OBG - Floor Beam Sub Assembly:
The QA Inspector randomly observed ZPMC welder Huang Xin Lan ID #044780, utilizing the Submerged Arc Welding (SAW) Process in the 1G Position (Flat Groove) with ZPMC WPS WPS-B-T-2221-B-L2c-S-1, to weld the fill pass in plate splice butt joint FB033-011-101 floor beam. The QA Inspector randomly observed ZPMC CWI Hu Wei Qing monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 513 amps, 29.0 volts with a travel speed of 435 mm per minute. The weld parameters appeared to comply with contract requirements.

QA Inspector JLizardo randomly observed ZPMC qualified welder Mr. Zhang Qing Quan ID #044774 repair fillet welding FB016-013-043 per Welding Repair Report B-WR415. Mr. Zhang was observed welding in the 2G

(horizontal) position utilizing a Flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic. QA Inspector Lizardo observed the ZPMC QC CWI Inspector Huang Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Huang Wei Qing to be: preheat temperature of 124°C and welding parameters amps of 282, volts of 30.5, a travel speed of 510 mm/min. Welding parameters observed by QA Inspector Lizardo appear to be in general compliance with the approved WPS-345-FCAW 2G(2F) Repair -1.

QA Inspector JLizardo randomly observed ZPMC qualified welder ID #044824 FCAW PJP welding longitudinal shear plate LD010-001-011. The welder was observed welding in the 2G (horizontal) position utilizing a Flux corded arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand E71T-1, class Supercored 71H, semi automatic. This shear web plate was beveled on the wrong side so ZPMC has to correct this by welding as it is but need to back gouge the other side of the web plate per written critical weld repair B-CWR090. QA Inspector Lizardo observed the ZPMC QC CWI Inspector Huang Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector were deemed acceptable. See photo below.

This QA observed continuing FCAW fillet welding on flange to web plate of floor beam FB009-003-003 and tack weld/fit-up of stiffener to web plate FB001-005-047/048. Fillet Welds between flange and web plate on floor beam FB009-003-009 was still having surface porosity. Although it is not as much as previously noted. See photo below. SMAW 2F minor repair on fillet welds on floor beams FF003-031 and FB003-049 due to undersize fillet welds using TL-508, 4.0mm diameter electrode this QA also observed. Four skewed connector plate (for 300mm X 300mm hollow steel diagonal brace) welded to the bottom flange of floor beam sub-assembly weld joint SSD9A-PP019A-133 and SSD9-PP019-132 were seen complete. Issue on how to measure the alignment between the stiffeners to the inside skewed connector plates could have been resolved by the previous shift for reason these were welded during their shift.

Bay 8: Tower Diaphragms
The QA Inspector randomly observed ZPMC welder Xu Pei Pei ID Number 050323, utilizing the SAW Process in the 1G (Flat Groove) Position with ZPMC WPS WPS-B-T-3221-B-U3c-S-1, to weld the fill pass on plate butt splice of Tower Diaphragm ESD1-SA316A/B-6B/12B and during the day, this plate was flipped upside down to continue welding the other side. The QA Inspector randomly observed ZPMC CWI Lvliqing, monitoring weld parameters. The QA Inspector also randomly monitored weld parameters and recorded them as follows: 585 amps, 30.4 volts with a travel speed of 475 mm per minute. The plate was preheated more than 180 degree C but not more than 230 degree C. Weld parameters appeared to comply with contract requirements.

Other related welding activities noted in this bay include back gouging on tower diaphragm plate splice butt joint after partially (SAW) welding the other side of WSD1-SA301 A/B-11B/12B. Cutting of heavy plates for tower diaphragm flanges also noted.

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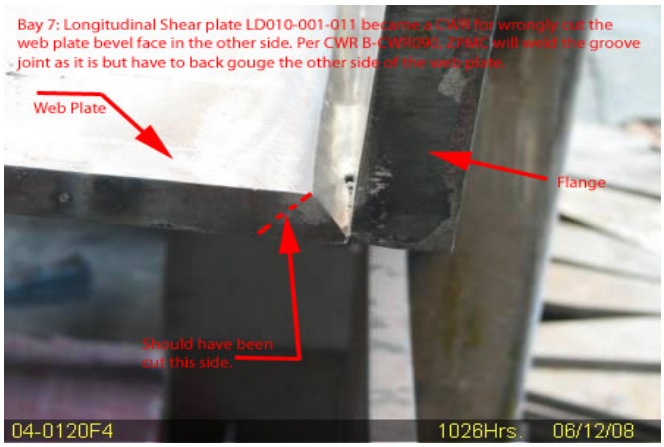

Summary of Conversations:

No significant conversation ocurred today.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By:	Lizardo,Joselito	Quality Assurance Inspector
Reviewed By:	Cochran,Jim	QA Reviewer